intended to be covered by the following claims.

WHAT IS CLAIMED:

1. Optical packet switching apparatus comprising:

An optical engine for switching signals from inputs to outputs depending upon predetermined provisioning;

A packet engine arranged to receive signals from said optical engine and to transmit signals to said optical engine after performing packet switching on said signals; and

A processor for determining, in response to at least one characteristic of traffic to the node, whether signals input to said optical engine should be switched directly to an output of said optical engine or first routed through said packet engine prior to being switched to an output of the optical engine.

2. Apparatus of claim 1 wherein said characteristic includes the percentage of total capacity of an optical input to said node that is to be switched to a single optical output of said node.

3. Apparatus of claim 1 wherein said characteristic is whether or not at least one inpute does not have any traffic destined for a predetermined output.

4. Apparatus of claim 1 wherein said packet engine is arranged to receive data from both said optical engine and from a packet network.

5. Apparatus of claim 1 wherein said packet engine and said optical engine are both connected to a single provisioning computer.

6. Apparatus of claim 1 wherein said optical engine comprises at least one multiplexer and at least one demulitplexer.

7. Apparatus of claim 1 wherein said packet engine is configured to receive plural inputs from a non optical packet network and plural inputs from said optical engine, and said optical engine is configured to receive plural inputs from an optical network and plural inputs from said packet engine.

8. An optical and packet switching device comprising plural optical inputs, plural packet inputs, plural optical outputs, and plural packet outputs, each optical input having a capacity, each of said optical inputs being selectively routed to either an optical output not connected to a packet input, or an optical output connected to a packet input, depending upon the percentage of the capacity of said optical input utilized.

9. The device of claim 8 wherein each of said optical inputs is connected to a multiplexer.

10. The device of claim 9 wherein said optical engine comprises at least one two port device and at least one three port device.

11. An optical switching device having first, second, and third cross bar switches, said

first cross bar switch having first inputs, second outputs, and third outputs, said second cross bar switch having fourth inputs and fifth outputs, said third cross bar switch having sixth and seventh inputs and eighth outputs, said third outputs being connected to said fourth inputs, said fifth outputs being connected to said sixth inputs, said first inputs and eight outputs being connected to an optical network.

12. The device of claim 11 wherein said seventh inputs and said second outputs are connected to a packet switching network.

13. The device of claim 12 wherein said first inputs and said eight outputs are connected to an optical network.

14. The device of claim 11 wherein said cross bar switches are provisioned by activating and deactivating specified mirrors therewithin.

15. A method of provisioning a node comprising optical switching and non optical switching portions, said method comprising the steps of ascertaining loading on the node caused by at least one optical input, and determining whether or not to switch said optical input through said nonoptical switching portion depending upon whether or not said optical input presents at least a predetermined load on said node.

16. The method of claim 15 wherein said predetermined load is measured by calculating a

capacity associated with an optical input, and determining what percentage of said capacity represents data arriving on said optical input and destined for a single optical output.

17. An optical switch comprising a first cross bar switch configured to receive information on plural inputs from a second cross bar switch, and to transmit outputs to a third cross bar switch, the second cross bar switch having the same number of inputs and outputs, and the first and third cross bar switches having different numbers of inputs and outputs.

18. The optical switch of claim 17 wherein the first cross bar switch has more outputs than inputs, the third cross bar switch has more inputs than outputs, and the second cross bar switch has as many inputs as outputs.

19. The optical switch of claim 18 wherein some inputs to the third cross bar switch are configured to receive data from the second cross bar switch, and some inputs are configured to receive data from a packet switch.

20. The optical switch of claim 19 wherein some inputs of the first crossbar switch are configured to transmit data to a packet switch, and some outputs of said first cross bar switch are configured to transmit data to said second cross bar switch.